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EVALUATING THE INJURIES INTO BITOLA'S REGION IN 2012, REAL ENTERPRISE EXPERIENCE AND WAYS FOR IMPROVING THE SAFETY SYSTEMS INTO REAL ENTERPRISES

Ivo Kuzmanov[1], Silvana Angelevska[2], Zore Angelevski[3], Vasko Stojanovski[4]

Summary: *The paper represents the results from the conducted research into ELEM Rek Bitola, considering the nature and the number of the injuries. The conducted research was done as a result of the every year activity of the NGO Bitola from Bitola, an safety and health organization. During the process of research two main sources of records were used. All of the information were gathered thanks to the injury sheet records from ELEM Rek Bitola, and the injury sheet records from the local inspectors (health and safety inspectors). The aim of the paper is to represent the results, considering several categories such as: the gender of the injured person, the age of the injured person, the aimed education of the injured person, the nature of the injury, the main cause for the injury, the day of the week when the injury is spotted, etc. All of the results could be used for continuous efforts in a matter of reducing the number of injuries in this business entity in 2013.*

Keywords: *injuries, key elements for injury, analyzing the number and the nature of the injuries in a real organization.*

1. INTRODUCTION

Safety on direct work places is one of the key aspects for every single business entity. The same one directly leads to motivated staff members, whose feelings as safer as can be in their workplaces, leads directly to maximum motivation and achievement on the defined business and work objectives. [1], [2]. This paper represents a conducted research, considering the nature and the number of injuries, in ELEM Bitola. The chosen business entity if one of the largest in Bitola's region whit a total number of 1781 directly employed people. Considering the fact that in Bitola's region there are numerous business entities with a total number of around 13.000 employees, it's more than obvious that the total number of employees in ELEM Rek Bitola is 13.7% of the total number of employed people into Bitola's region.

[1] PhD, Ivo Kuzmanov, Bitola, Faculty of Technical Science, (ivo_kuzmanov@yahoo.com)
[2] PhD, Silvana Angelevska, Bitola, Faculty of Technical Science, (silvana.angelevska@uklo.edu.mk)
[3] PhD, Zore Angelevski, Bitola, Faculty of Technical Science, (zore.angelevski@uklo.edu.mk)
[4] PhD, Vasko Stojanovski, Bitola, Faculty of Technical Science, (vasko.stojanovski@uklo.edu.mk)

Considering the number of employed people in the industrial system, and the nature of work at the same one, the safety on direct work places is key point of view. On the other hand, the injuries spotted in the enterprise are one of the main activities for several institutions such as: the local safety inspectors, the NGO Bitola (local safety and health organization), Macedonian labor ministry, etc. [1]

The sources, from the above mentioned institutions, that were used to get relevant information about the number of injuries were [1]:

- Annually submitted sheets given by the business entity (ELEM Rek Bitola)
- Submitted annually sheets from the local labor inspectors, considering the spotted injuries in ELEM Rek Bitola in 2012.

The basic aim of this paper is to represent the injuries in the previously mentioned industrial system, considering several key points of view. The gathered information's about the injuries in ELEM Rek Bitola in the period January – December 2012, were analyzed in March 2013. All of the information's are given in addition of the paper.

2. PRESENTING THE INDUSTRIAL SYSTEM

The industrial system that is represented in this paper is ELEM Rek Bitola. It is an industrial system whose main activities are excavation on carbon and electricity production. The same one is active since 1980 and accounts over 72% of total electricity production in Macedonia. At the moment there are 1781 directly empoyeed people. Considering the gender 1668 emplyees are male and 113 employees are female. Considering the nature of the work, there are several groups of employees with different levels of education. Table 1 represents the qualification of the staff memebrs in ELEM Rek Bitola.

Table 1 *Qualifications of the staff members*

Qualifications	Number of employees
Low qualifications/without education (НКВ)	297
Highly qualified employee/low education (ВКВ)	582
High school (ССС)	756
Higher profesional education (ВШС)	48
University degree (ВСС)	79
Master degree (м-р.)	19
TOTAL NUMBER	**1781**

Taking in mind that the work of the business entity is excavation of carbon and production of electricity, the injuries are comon part of every day activity. So all of the injuries are represented in addition of the paper, but at this point is't wery important to say that 872 work days were lost as a result from an injury, considering the sheets from ELEM Rek Bitola. But on the other hand if the records from the local inspectors are analyzed the total amount of lost work days in this business entity (as a result of spotted injuries) are up to 1136 work days.

3. PRESENTING THE MAIN CRITERIAS

All of the results from the conducted research, considering the work injuries on direct work places, were analyzed in March 2013, and using the sheets from the NGO Bitola, the same one are catagorized in several categories, such as [1], [2], [3]:

- Gender of the injured person
- Qualifications of the staff members that were injured
- The nature of the injury
- The body part injured
- Day of the week (when the injury is spotted)
- The time frame of the day
- Age of the injured person
- Cause for injury
- Lost work days

All of the above mentioned criterias are taken into consideration, because they are part of the sheets (records) given from the business entity, and from the local labour inspectors. Considering the two sources for information (local labour inspectors and ELEM Rek Bitola as an business entity), some of the criterias has different results (different numbers). But considering that the local labour inspectors, must document every injury, all of the informations represented in addition of the paper are from the local labour inspectors (safety and health inspectors in Bitola's region).

4. PRESENTING THE RESULTS FROM THE CONDUCTED RESEARCH

4.1 Gender of the injured persons

Considering that the total number of employees in ELEM Rek Bitola at the moment is 1781 people, an relevant sub-criteria is the percent of injured persons. If the number of injured persons (75 spotted, considering ELEM Rek Bitola as a source for information) is divided with the number of employees (1781), the total percent of injured people is 4.2%. That means that every 4-th person out of 100 has suffered an injury as a result of the every day work activities. Having in mind the nature of the industrial system, and the work processes, the represented number isn't such high, but continuous efforts must be done, so the number of injured persons is expected to be reduced in this year.

On the other hand, considering the gender of the injured persons, Table 2 is a tabular representation of the situation.

Table 2 *Gender of the injured staff members in ELEM Rek Bitola, year 2012*

Gender	**Total number of injured staff members (informations from ELEM Rek Bitola)**		**Total number of injured staff members (informations from local inspectors)**	
	in numbers	in percent (%)	in numbers	in percent (%)
Male	69	92%	75	93.8%
Female	6	8%	5	6.2%
TOTAL	**75**		**80**	

4.2 Aimed education of the injured staff members

If the results shown in Table 2 are seen, it can be concluded that some variation of the results are present (75 spotted injuries according to ELEM Rek, 80 spotted injuries acording to local safety and health inspectors). So, in all of the following presented results, considering this and other criterias, the informations are from the local inspectors, as a relevant source.

Seeing the organization structure considering the level of education, represented in part 2 in the paper, several levels of education are present in the business entity. On the other hand, analyzing the results from the local inspectors, the spotted injuries, considering the level of aimed education of the injured staff member, could be categorized such in Table 3 in addition.

Table 3 *Aimed education of the injured staff member in ELEM Rek Bitola*

Aimed education	Total number of spotted injuries	In percent (%)
Low qualifications - without education (НКВ)	13	16.25%
High school (ССС)	56	70%
Higher profesional education (ВШС)	2	2.5%
University degree (ВСС)	9	11.25%
TOTAL	**80**	**100%**

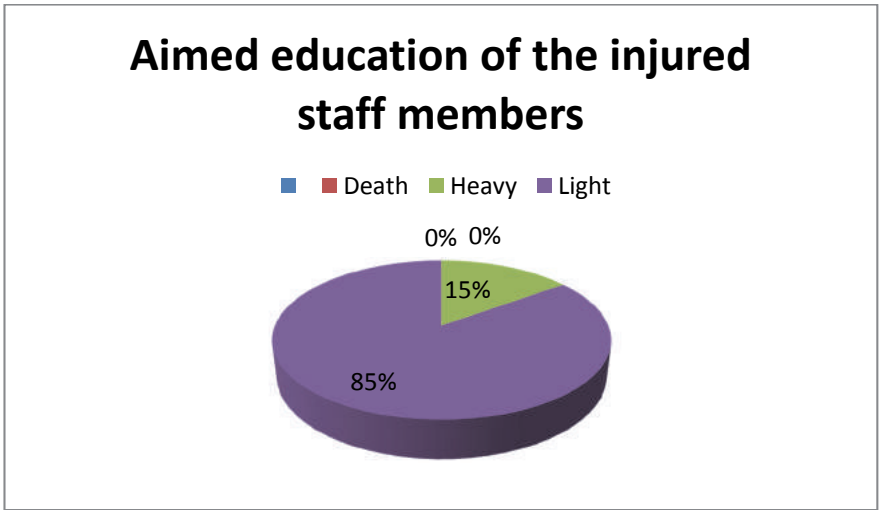

Fig. 1 *Illustrative view on Table 3*

4.3 Nature of the injury

Considering that there are blank sheets where during the year, all of the business subjects record the informations about the spotted injuries, the nature of the injury is devided in three main categories such as [1]:

- Death

- Heavy injury
- Light injury.

As a result of the spotted injuries 1136 work days were lost (as a result from the 80 spotted injuries acording to the local laboyr inspectors), or 872 work days lost (considering the results from ELEM Rek Bitola). In Table 4 and Figure 2, all of the results, according to the local inspectors, are represented.

Table 4 *Nature of the injury*

Nature of the injury	**Total number of injuries according to Local inspectors**	
	In numbers	In percents (%)
Death	0	0.0%
Heavy	12	15.0%
Light	68	85.0%
TOTAL	**80**	**100%**

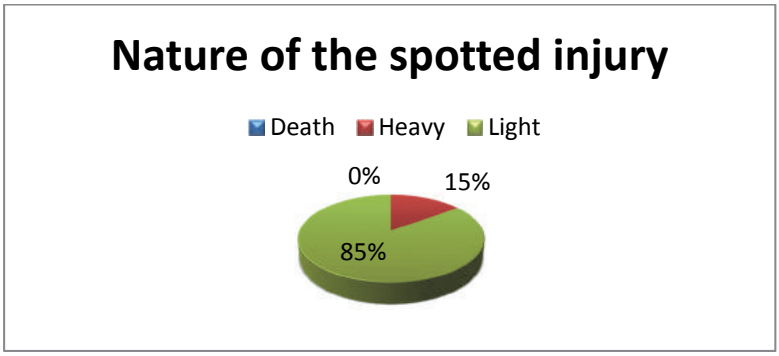

Fig. 2 *Nature of the spotted injury in ELEM Rek Bitola in 2012*

Furthermore, the body part that was injured is a very relevant information. All of the injuries were categorized in several categories. Table 5 and Figure 3 are relevant representation of the informations, considering the body part that was injured.

Table 5 *Body part that was injured (informations from spotted injuries in ELEM Rek Bitola in 2012)*

Body part	**Total number of injuries**	**In percent (%)**
Head	10	11%
Body	16	18%
Arm	29	32%
Leg	36	39%
TOTAL	**91**	**100%**

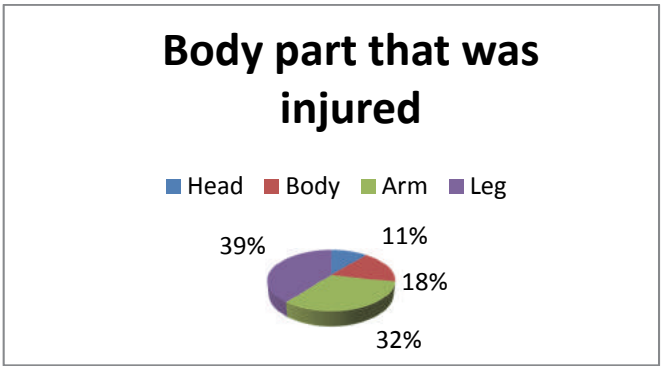

Fig. 3 *Body part that was injured (Illustrative representation of the Table 5)*

Seeing the results, and comparing with the total number of spotted injuries (80), an conclusion is that several of the injuries, to be more precise several of the injured persons has had multiple body injuries, and that is the main reason why the total number of spotted injuries, considering the criteria body part that was injured, is 91. On the other hand, most injured body parts were arms and legs with an total number of 65 injuries out of 91 spotted.

4.4 Cause for the injury

The cause for the injury is one of the most relevant facors, because that is the main criteria for further continuous efforts in a matter for reducing the number of injuries in the industrial system. Considering the causes, they are devided in several key categories such as: mechanical, chemical, electrical nature, lack of equipment for personal safety and other relevant factors. All of the data (from ELEM Rek Bitola), are represented into Table 6 and Figure 4 in addition.

Table 6 *Cause for the spotted injury in ELEM Rek Bitola (2012)*

Cause for the injury	Total number of injuries	In percent (%)
Mechanical	36	45%
Chemical	0	0%
Electrical nature	2	2.5%
Lack of HTZ equipment	42	52.5%
TOTAL	**80**	**100%**

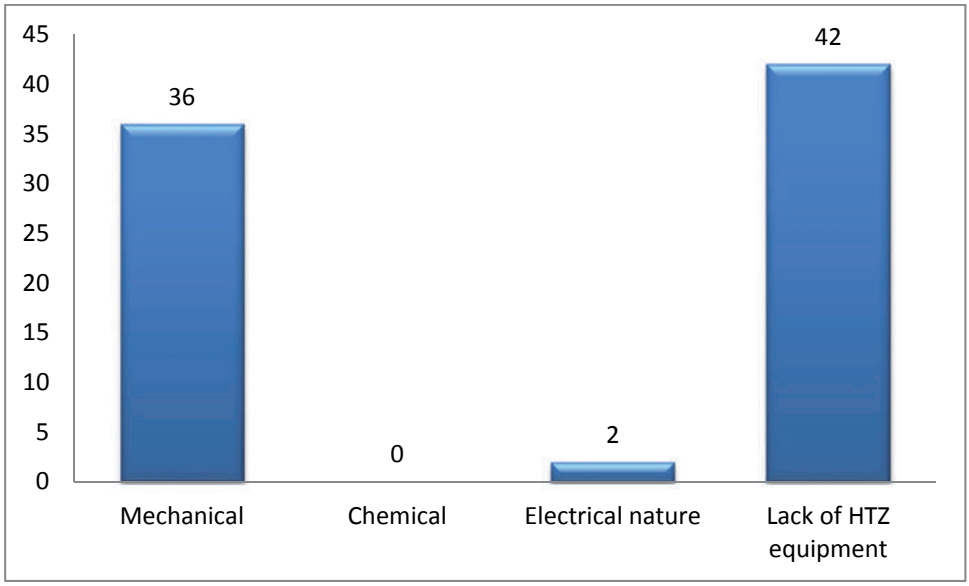

Fig. 4 *Illustrative view on Table 6 (Cause for the spotted injury in ELEM Rek Bitola)*

4.5 Day of the week

The day of the week, when the injury is spotted is another relevant information, that should be considered during the preventive activities. All of the informations considering this criteria and considering the injuries, are represented into Table 7 and Figure 5 in addition.

Table 7. *Day of the week, when the injury is spotted (business entity ELEM Rek Bitola)*

Day in the week	Number of spotted injuries	In percent (%)
Monday	17	21.25%
Tuesday	13	16.25%
Wednesday	12	15%
Thursday	12	15%
Friday	17	21.25%
Saturday	6	7.5%
Sunday	3	3.75%
TOTAL	**80**	**100%**

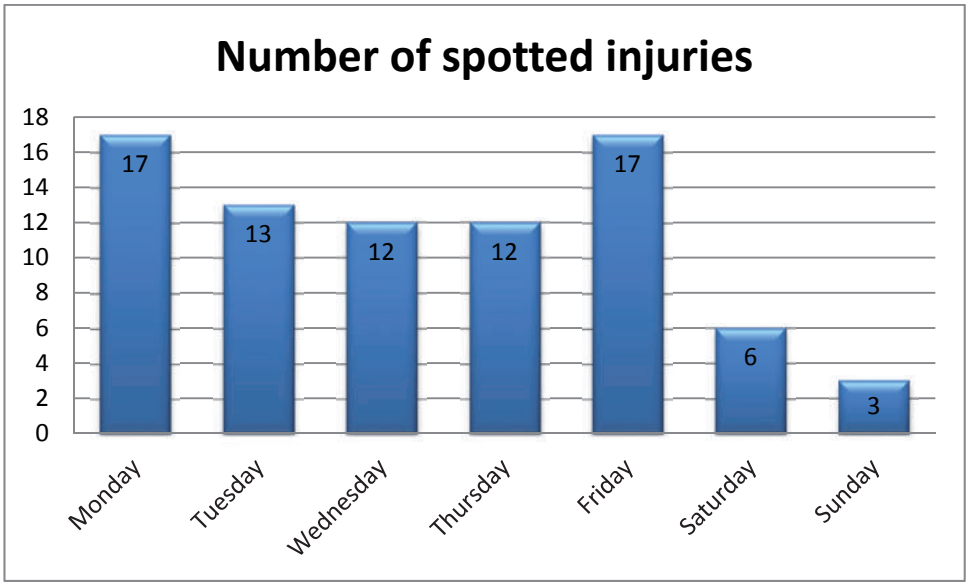

Fig. 5 *Illustrative view – Day of the week (ELEM Rek Bitola),2012*

Taking into consideration the numbers from the Table 7, so-called black days were Monday and Friday. Actually in both of the days 42.5 % of the injuries were spotted. If an long therm research is done, the days could be also one of the factors for continuous improvements in the area of safety and helth.

5. CONCLUSION

The paper represents an research on the injuries in ELEM Rek Bitola. Seeing the results from the conducted research, using two main sources for information (informations from the business entity and from the local inspectors), several conclusions could be made. All of the informations could be used for a further long therm analysis, considering the past 5 years, in a matter for continuous improvements of the health and safety situation in the eneity, and in a matter for reducing the number of injuries in the following year.

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